IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION

JAWBONE INNOVATIONS, LLC,	§	
	§	
Plaintiff,	§	
	§	
v.	§	Case No. 2:21-CV-00186-JRG-RSP
	§	
SAMSUNG ELECTRONICS CO. LTD. and	§	
SAMSUNG ELECTRONICS AM., INC.	§	
	§	
Defendants.	§	

CLAIM CONSTRUCTION ORDER

Jawbone Innovations, LLC, accuses Samsung Electronics Co. Ltd. and Samsung Electronics America, Inc., (together, "Samsung") of infringing claims of U.S. Patents 7,246,058 (the "'058 Patent"); 8,019,091 (the "'091 Patent"); 8,467,543 (the "'543 Patent"); 8,503,691 (the "'691 Patent"); 10,779,080 (the "'080 Patent"); and 11,122,357 (the "'357 Patent"). Each of these patents relates to noise suppression in acoustic signal processing.

The parties present seven disputes about claim scope. Having considered the parties' briefing, along with arguments of counsel during an August 2, 2022 hearing, the Court resolves the disputes as follows.

I.   LEGAL STANDARDS

A.   Generally

"'[T]he claims of a patent define the invention to which the patentee is entitled the right to exclude.'" *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005) (en banc) (quoting *Innova/Pure-Water, Inc. v. Safari Water Filtration Sys., Inc.*, 381 F.3d 1111, 1115 (Fed. Cir. 2004)). As such, if the parties dispute the scope of the claims, the court must determine their meaning. *See, e.g.*, *Verizon Servs. Corp. v. Vonage Holdings Corp.*, 503 F.3d 1295, 1317 (Fed. Cir. 2007); *see*

also Markman v. Westview Instruments, Inc., 517 U.S. 370, 390 (1996), *aff'g*, 52 F.3d 967, 976 (Fed. Cir. 1995) (en banc).

Claim construction, however, "is not an obligatory exercise in redundancy." *U.S. Surgical Corp. v. Ethicon, Inc.*, 103 F.3d 1554, 1568 (Fed. Cir. 1997). Rather, "[c]laim construction is a matter of [resolving] disputed meanings and technical scope, to clarify and when necessary to explain what the patentee covered by the claims . . . ." *Id.* A court need not "repeat or restate every claim term in order to comply with the ruling that claim construction is for the court." *Id.*

When construing claims, "[t]here is a heavy presumption that claim terms are to be given their ordinary and customary meaning." *Aventis Pharm. Inc. v. Amino Chems. Ltd.*, 715 F.3d 1363, 1373 (Fed. Cir. 2013) (citing *Phillips*, 415 F.3d at 1312–13). Courts must therefore "look to the words of the claims themselves . . . to define the scope of the patented invention." *Id.* (citations omitted). "[T]he ordinary and customary meaning of a claim term is the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention, i.e., as of the effective filing date of the patent application." *Phillips*, 415 F.3d at 1313. This "person of ordinary skill in the art is deemed to read the claim term not only in the context of the particular claim in which the disputed term appears, but in the context of the entire patent, including the specification." *Id.*

Intrinsic evidence is the primary resource for claim construction. *See Power-One, Inc. v. Artesyn Techs., Inc.*, 599 F.3d 1343, 1348 (Fed. Cir. 2010) (citing *Phillips*, 415 F.3d at 1312). For certain claim terms, "the ordinary meaning of claim language as understood by a person of skill in the art may be readily apparent even to lay judges, and claim construction in such cases involves little more than the application of the widely accepted meaning of commonly understood words." *Phillips*, 415 F.3d at 1314; *see also Medrad, Inc. v. MRI Devices Corp.*, 401 F.3d 1313, 1319 (Fed.

Cir. 2005) ("We cannot look at the ordinary meaning of the term . . . in a vacuum. Rather, we must look at the ordinary meaning in the context of the written description and the prosecution history."). But for claim terms with less-apparent meanings, courts consider "'those sources available to the public that show what a person of skill in the art would have understood disputed claim language to mean[,] [including] the words of the claims themselves, the remainder of the specification, the prosecution history, and extrinsic evidence concerning relevant scientific principles, the meaning of technical terms, and the state of the art.'" *Phillips*, 415 F.3d at 1314 (quoting *Innova*, 381 F.3d at 1116).

B.   Indefiniteness

"[A] patent is invalid for indefiniteness if its claims, read in light of the specification delineating the patent, and the prosecution history, fail to inform, with reasonable certainty, those skilled in the art about the scope of the invention." *Nautilus, Inc. v. Biosig Instruments, Inc.*, 572 U.S. 898, 901 (2014). "A patent must be precise enough to afford clear notice of what is claimed," but that consideration must be made while accounting for the inherent limitations of language. *Id.* at 908–09. "Indefiniteness must be proven by clear and convincing evidence." *Sonix Tech. Co. v. Publ'ns Int'l, Ltd.*, 844 F.3d 1370, 1377 (Fed. Cir. 2017).

II.   THE LEVEL OF ORDINARY SKILL IN THE ART

The level of ordinary skill in the art is the skill level of a hypothetical person who is presumed to have known the relevant art at the time of the invention. *In re GPAC*, 57 F.3d 1573, 1579 (Fed. Cir. 1995). In resolving the appropriate level of ordinary skill, courts consider the types of and solutions to problems encountered in the art, the speed of innovation, the sophistication of the technology, and the education of workers active in the field. *Id.* Importantly, "[a] person of ordinary skill in the art is also a person of ordinary creativity, not an automaton." *KSR Int'l Co. v.*

Teleflex Inc., 550 U.S. 398, 421 (2007).

Here, the parties generally agree on the appropriate level of ordinary skill in the art. Jawbone, through its expert, contends a skilled artisan at the time of invention "would have a bachelor's degree in . . . electrical engineering, computer engineering, or equivalent, with one to two years of experience in the area of real-time signal processing and signal processing for acoustic signals." Brown Decl., Dkt. No. 67-1 ¶ 58. Samsung's proffered skill level is similar: "a bachelor's degree in electrical engineering, computer science, audio engineering or a similar field and two years of experience in a relevant field, such as, acoustics, speech recognition, speech detection, signal processing, and/or designing microphone arrays." Dkt. No. 71 at 3 (citing Kiaei Decl., Dkt. No. 67-4 ¶ 26). Neither party contends the differences in their respective skill levels, if any, are material to resolving the disputes they present.

III.   THE DISPUTED TERMS

A.   "a signal processor coupled with the first and second microphone signals and operative . . . to apply a varying linear transfer function between the first and second microphone signals" ('357 Patent, Claim 1); "a processing component . . . applying a varying linear transfer function between the acoustic signals" ('080 Patent, Claim 14)

Plaintiff's Construction	Defendants' Construction
Plain and ordinary meaning except for "transfer function"	"a signal processor coupled with the first and second microphone signals and operative . . . to apply a varying linear transfer function to the first microphone signal and to apply the varying linear transfer function to the second microphone signal" Otherwise indefinite.

These patents disclose "[a] dual omnidirectional microphone array (DOMA) that provides improved noise suppression" in a speech-communications system. '357 Patent at 5:8–9; *see also*

'080 Patent at 3:49–50 (same). Generally, they teach configuring two virtual directional microphones to have similar noise responses but dissimilar speech responses. *See* '357 Patent at 5:11–15; '080 Patent at 3:52–56. The system then uses involved math and information from a voice activity detector (VAD)[1] to reduce the noise in the signal without distorting the speech. *See* '357 Patent at 5:16–21; '080 Patent at 3:57–60.
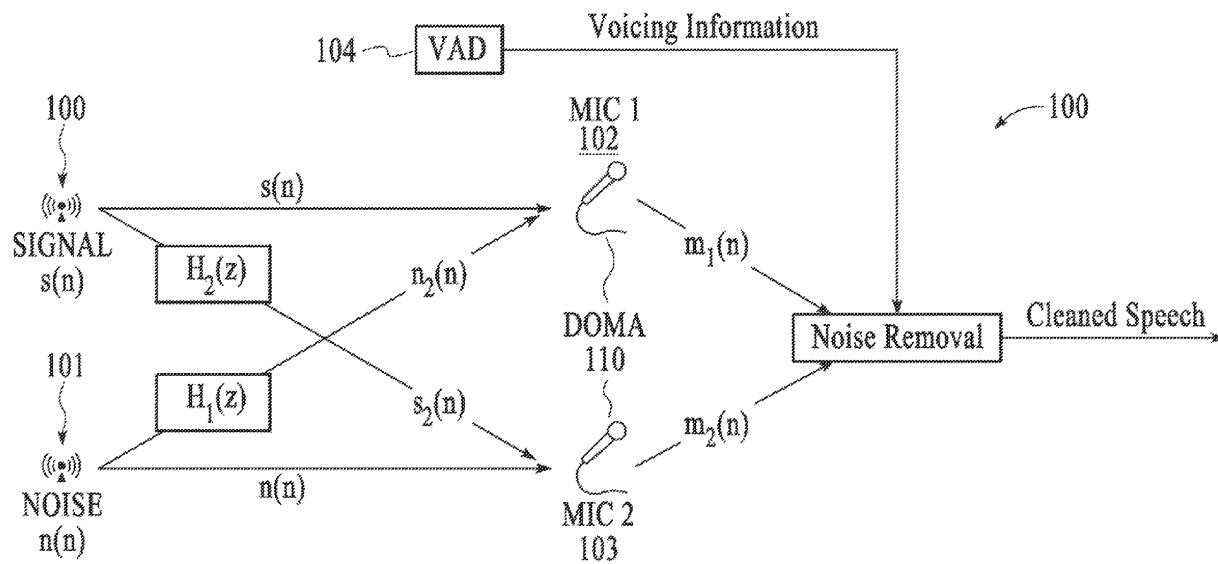
Fig. 1 of the '357, '691, and '080 Patents

The '357 Patent describes a suitable algorithm with reference to Fig. 1. After explaining the math, the patent provides a formula for removing noise while leaving the original signal:

$$S(z) = (M_1(z) - M_2(z) \, H_1(z)) \, / \, (1 - H_2(z) \, H_1(z)), \qquad \text{(Eq. 3)}$$

where $M_1(z)$ and $M_2(z)$ are the total acoustic information (i.e., noise and signal) received by MIC 1 and MIC 2, respectively, and $H_1(z)$) and $H_2(z)$ are transfer functions. '357 Patent at 7:40–43. Equation 3 can be simplified in "well-performing systems" where "there is little or no leakage

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[1] The '091 Patent describes a typical VAD, which "uses physiological information to determine when a speaker is speaking." *See* '091 Patent at 3:39–50. In general, the VAD outputs a "0" when there is no speech and a "1" when speech is produced. *Id.* at 3:65–4:2.

from the speech source into MIC 2" as:

$$S(z) = M_1(z) - M_2(z)\, H_1(z). \qquad\qquad \text{(Eq. 4)}$$

Id. at 7:45–52.

Each claim at issue seemingly uses this process by requiring a signal processor connected to two virtual microphones, with the processor then (1) filtering and summing the signals; (2) applying a transfer function, and (3) generating an output signal with attenuated noise relative to speech. For example, Claim 1 of the '357 Patent requires first and second virtual microphones and

> a signal processor coupled with the first and second microphone signals and operative to combine the first and second microphone signals by filtering and summing in the time domain, to apply a varying linear transfer function between the first and second microphone signals, and to generate an output signal having noise content that is attenuated with respect to speech content.

'357 Patent at 34:56–35:10; *see also* '080 Patent at 36:3–11 (reciting "a processing component . . . applying a varying linear transfer function between the acoustic signals").

The parties' dispute focuses on the "processor" limitation and, more specifically, the meaning of "apply[ing] a varying linear transfer function between" the signals. Jawbone suggests two separate transfer functions could be "applied," one to each acoustic signal, or even that only one transfer function could be used. Dkt. No. 67 at 6. Samsung, on the other hand, contends this language means the same transfer function must be applied to each microphone signal. Dkt. No. 71 at 5–6 (citing '357 Patent at 8:27–39; '080 Patent at 7:4–16).

To support its position, Samsung relies on the last paragraph explaining Fig. 1, which describes an adaptive filter that "relies on a slowly varying linear transfer function between the two microphones for sources of noise." Dkt. No. 71 at 6 (quoting '357 Patent at 8:31–35). Samsung also relies on excerpts from Plaintiff's expert's deposition. Dkt. No. 71 at 6–7. Its construction

"makes sense," says Samsung, "because the noise removal block relates the signal and noise components of the two microphones at a particular time and uses that relationship to generate the denoised signal." *Id.* at 7.

Although the parties' arguments focus on the word "between" in isolation, the parties' arguments are better understood to be addressing the issue of whether the phrase—"between the first and second microphone signals"—limits "transfer function" or "to apply." Given the parties' arguments, the Court finds that the phrase limits "transfer function," not "to apply."

Both intrinsic and extrinsic evidence support this conclusion, as does the parties' agreed construction for "transfer function." *See* Dkt. No. 67 at 4 ("a mathematical expression that specifies the relationship *between* an output signal and an input signal"). For example, in Equation 2, the output and input signals are the noise at MIC 1 (or $M_1N(z)$) and the noise at MIC 2 (or $M_2N(z)$), respectively, in a no-speech condition. *See* '357 Patent at 6:45–60. Thus, $H_1(z)$ in Equation 2 is "a transfer function between the first and second microphone signals," and the claims merely require that $H_1(z)$ (or some other transfer function "between the first and second microphone signals") be applied. Moreover, when describing Fig. 1, the specification notes an adaptive filter that "relies on a transfer function *between* the two microphones," '357 Patent at 8:34–35, thereby explaining the nature of the *transfer function* being relied upon, not how to apply a transfer function.

As for extrinsic evidence, other signal-processing patents use "transfer function between" in similar fashion. *See, e.g.*, Abe, Kazutaka and Miyasaka, Shuji. "Signal Processor." U.S. Patent 10,560,782 (Feb. 11, 2020) at [57] (defining GYY as "a transfer function *between* the Y-side speaker and the Y-side ear" and GXY as "a transfer function *between* the X-side speaker and the Y-side ear" (emphasis added)); Ganeshkumar, Alaganandan. "Audio Signal Processing for Noise Reduction." U.S. Patent 10,499,139 (Dec. 3, 2019) at 22:20–21 ("Such a pre-filter may model a

nominal transfer function *between* an acoustic driver and one or more microphones" (emphasis added)); Liberti, Joseph C. and Chang, Nicholas. "Signal Jamming Suppression." U.S. Patent 9,577,785 (Feb. 21, 2017) at 12:57–62 (defining $H_{RJ}(f)$ as "[t]he total transfer function *between* jammer and a receiver node" (emphasis added; reference numbers omitted)).

Finally, Samsung argues in the alternative that, if its construction is not adopted, the term is indefinite because a skilled artisan would not know which transfer function should be applied to which microphone signal. Dkt. No. 71 at 5. But the claim language itself informs what transfer function should be applied—either "a transfer function between the first and second microphone signals" or "a transfer function between the acoustic signals," depending on the claim. Regardless, this alternative argument concerns breadth rather than indefiniteness. While the disputed phrase is broad in that it does not limit how or to what the transfer function is "applied," that does not render it indefinite.

In sum, the Court expressly rejects Samsung's construction. Otherwise, this term will be given its plain and ordinary meaning.

B.   "response [to speech/noise]" / "linear response [to speech/noise]" ('357 Patent, Claims 1, 15, 17; '080 Patent, Claims 1, 7, 9, 14; '691 Patent, Claims 1, 3–7, 23–34, 41–45)

Plaintiff's Construction	Defendants' Construction
"output [in response to speech/noise]" / "output of a linear system [in response to speech/noise]"	"[linear] sensitivity in the direction of [speech/noise]"

These terms appear in claim language generally reciting the characteristics of virtual microphones. For example, Claim 1 of the '357 Patent requires that "the first virtual microphone and the second virtual microphone are distinct virtual directional microphones with substantially similar *responses to noise* and substantially dissimilar *responses to speech*." '357 Patent at 34:65–

35:2 (emphasis added).

In their briefing, the parties dispute whether "response" is limited to a "directional response," as shown in Figs. 9–13 of the patents, or whether "response" also includes a "frequency response" as shown in Fig. 14. *See* Dkt. No. 67 at 9 (alleging "Samsung's construction would limit a 'response' to a 'directional response,' reading out the frequency responses discussed in the specification"); *see also* Dkt. No. 78 at 3 (asserting "the figures demonstrate that response includes both frequency response and directional response").

The Court agrees with Samsung. The patents clearly focus on the directional response of the system. For example, they describe "[a] dual omnidirectional microphone array . . . used to form two distinct virtual *directional* microphones which are configured to have very similar noise responses and very dissimilar speech responses." '357 Patent at 5:8–15 (emphasis added). The patents also repeatedly refer to "the response" of certain functions to speech as shown in polar patterns. *See, e.g., id.* at 12:55–56 ("*The response* of V_1 to speech is shown in Fig. 11, and *the response* to noise in Fig. 12." (emphasis added)); *id.* at 11:42–49 (explaining "Fig. 10 is a plot of *linear response* of virtual microphone V_2").

In contrast, the patents do *not* explain how to differentiate noise from speech based on *frequency* response, nor do they use "the response" to mean "frequency response." Jawbone's briefing relies on Fig. 14 and Figs. 19–22 to suggest otherwise,[2] but these figures and their related text simply explain acceptable tradeoffs for implementing the described methodology. *See* '357 Patent at 12:61–13:13 (explaining, with respect to Fig. 14, that using the disclosed method has a different frequency response relative to a normal directional microphone within a certain frequency

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[2] Despite its briefing, during the hearing Jawbone indicated it did not assert this term encompasses frequency response.

range, but "the superior noise suppression" of the invention "more than compensates"); *see also id.* at 15:47–60 (noting, with respect to Fig. 19, "the resulting phase difference clearly affects high frequencies more than low," but "this system would likely perform well at frequencies up to approximately 8 kHz"); *id.* at 16:25–35 (explaining, with respect to Fig. 21, that a cancellation below about -10 dB for frequencies below 6 kHz means "an error of this type will not significantly affect the performance of the system").

That said, the Court rejects Samsung's construction, which limits *how* the response must be determined rather than the scope of the "response" itself. *See, e.g.*, Dkt. No. 71 at 9 (asserting "the response to speech or noise must be based on the sensitivity of the microphone in the direction from where the sound is coming from"); *id.* at 13 (claiming the intrinsic evidence "clearly demonstrates that 'response' to speech or noise (frequency or otherwise) *is determined by* the 'sensitivity in the direction' from which the sound is received" (emphasis added, but original emphasis omitted)). Accordingly, the Court will give this term its plain and ordinary meaning, which does not include "frequency response."

C.   **"an adaptive noise removal application coupled to . . . and generating" ('080 Patent, Claim 1)**

Plaintiff's Construction	Defendants' Construction
Plain and ordinary meaning.	Indefinite

This claim requires "a microphone array," "a processing component coupled to the microphone array," and "an adaptive noise removal application coupled to the processing component and generating denoised output signals[.]" '080 Patent at 33:39–67.

Samsung challenges the definiteness of this claim on two grounds. First, Samsung contends the claim mixes statutory classes by including a method step of "generating." Dkt. No. 71 at 13–

14 (relying on *Rembrandt Data Techs. LP v. AOL, LLC*, 641 F.3d 1331 (Fed. Cir. 2011)). Second, even if "generating" refers to a capability rather than a method step, the claim does not identify with reasonable certainty which component of the system has the capability. *Id.* at 15.

A skilled artisan would recognize the "adaptive noise removal application" is a set of instructions residing in memory to be executed by the "processing component." *See* https://www.yourdictionary.com/application (defining "application" as "of or being a computer program designed for a specific task or use) (last visited Aug. 5, 2022). This is consistent with the description and figures, which do not identify any *physical* structure associated with the "application." *See* '080 Patent at Fig.4 (item 402). Thus, the most natural understanding of the disputed language is a set of instructions for "generating denoised output" by forming, filtering and summing, and applying[3] the transfer function. As such, this is not a mixed-class claim, and it is clear the application includes instructions to "generat[e] denoised output signals." This term is not indefinite.

> **D.** **"an adaptive noise removal application . . . generating denoised output signals by forming a plurality of combinations . . . by filtering and summing the plurality of combinations . . . and by a varying linear transfer function between the plurality of combinations" ('080 Patent, Claim 1)**

Plaintiff's Construction	Defendants' Construction
Plain and ordinary meaning; no construction necessary except for "transfer function"	Indefinite

The last limitation of the claim recites:

> an adaptive noise removal application coupled to the processing component and generating denoised output signals [1] by forming a plurality of combinations of signals output from the first virtual microphone and the second virtual microphone, [2] by filtering and summing the plurality of combinations of signals in the time

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[3] *See* Part III.D. *infra*.

domain, and [3] by a varying linear transfer function between the plurality of combinations of signals, wherein the denoised output signals include less acoustic noise than acoustic signals received at the microphone array.

'080 Patent at 33:57–67. Samsung asserts the limitation is missing a verb in the third step between "a" and "by."[4] It claims there are at least four equally possible but different verbs, each of which results in a different scope for the phrase—"use," "apply," "rely," and "determine." Dkt. No. 71 at 17–18. As such, says Samsung, the claim is indefinite.

To start, neither "rely" or "determine" make sense in the context of the claim. The specification's sole reference to "relying" on the transfer function is general in nature and does not specifically refer to the individual steps of the claimed method. *See* '080 Patent at 7:7–12 ("The adaptive filter generally uses the signal received from a first microphone of the DOMA to remove noise from the speech received from at least one other microphone of the DOMA, which relies on a slowly varying linear transfer function between the two microphones for sources of noise."). And simply "determining" the transfer function would not advance the recited goal of "generating denoised output signals" without more action.

To achieve the "denoising," one must "use" or "apply" the transfer function, and there is no significant difference in scope between those two verbs. Although Samsung insinuates differences in their meanings based on the testimony of Jawbone's expert, *see* Dkt. No. 71 at 17, it does not proffer its own interpretation or explain the purported difference from a claim scope perspective.

Ultimately, a skilled artisan would understand the recited transfer function must be applied to be useful, as recited elsewhere in the claims. *See* '080 Patent at 36:4–11 (reciting, in Claim 14,

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[4] Jawbone does not concede this point.

a processing component "including an adaptive noise removal application . . . *applying a varying linear transfer function* between the acoustic signals, and generating an output signal" (emphasis added)). Accordingly the Court construes the last part of the disputed phrase as ". . . by applying a varying linear transfer function between the plurality of combinations of signals . . . ."

E.   "microphone" ('543 Patent, Claims 1, 26)

Plaintiff's Construction	Defendants' Construction
Plain and ordinary meaning	"physical microphone"

The '543 Patent teaches systems that use a microphone array to receive acoustic signals from an environment. Based on the received acoustic signals, the system selects an appropriate denoising method and applies that selected method to generate denoised acoustic signals. For example, Claim 1 requires:

> a denoising subsystem coupled to the voice detection subsystem, the denoising subsystem comprising *a microphone array* including a plurality of *microphones*, wherein *a first microphone* of the array is fixed at a first position relative to a mouth, wherein the first position orients a front of *the first microphone* towards the mouth, wherein *a second microphone* of the array is fixed at a second position relative to the mouth, wherein the second position orients a front of *the second microphone* away from the mouth such that the second position forms an angle relative to the first position, wherein the angle is greater than zero degrees, *the microphone array* providing acoustic signals of an environment to components of the denoising subsystem, components of the denoising subsystem automatically selecting at least one denoising method appropriate to data of at least one frequency subband of the acoustic signals using the control signals and processing the acoustic signals using the selected denoising method to generate denoised acoustic signals, wherein the denoising method includes generating a noise waveform estimate associated with noise of the acoustic signals and subtracting the noise waveform estimate from the acoustic signal when the acoustic signal includes speech and noise[.]

'543 Patent at 24:2–37. Claim 26 includes the same limitation. *Id.* at 26:10–57.

The parties dispute whether "microphone" in Claims 1 and 26 includes "virtual microphones," which the parties agree comprise two or more omnidirectional physical microphones plus some signal processing. Dkt. No. 67 at 4 (reciting the parties' agreement about the construction for "virtual microphone" as used in claims of other patents). Samsung cites extensive intrinsic evidence it contends supports its construction. Dkt. No. 71 at 19–21. Further, Samsung submits two dictionary definitions that define "microphones" as physical devices. *Id.* at 23. But according to Jawbone, any type of microphone may be used. Dkt. No. 67 at16 (citing '543 Patent 6:44–7:26).

Although Jawbone correctly notes there is no limiting definition or prosecution history in the specification, it fails to satisfy the threshold issue—that the plain and ordinary meaning of "microphone" to a skilled artisan at the time of invention would have included "virtual microphone." Although Jawbone suggests the specification supports the notion that any type of microphone may be used, *id.* at 16 (citing '543 Patent at 6:44–7:26), nowhere does the patent mention "virtual microphones" or describe something other than a physical microphone. At best, Jawbone offers intrinsic evidence *consistent with* its position, such as that the directivity patterns in the patent are also frequently found in virtual microphones, and the patent contemplates the use of unidirectional microphones, which could be implemented virtually. Dkt. No. 67 at 15. But consistency alone is not enough.

Jawbone offers no persuasive evidence that the plain and ordinary meaning of "microphone" at the time of invention included the notion of a "virtual microphone." All of the intrinsic evidence teaches otherwise. The Court adopts Samsung's proposed construction.

F.   "the one receiver" / "the two receivers" ('058 Patent, Claim 1)

Plaintiff's Construction	Defendants' Construction
Plain and ordinary meaning. Alternatively: "the one receiver": "the one of the two microphones" "the two receivers": "the two microphones that receive the acoustic signals"	Indefinite

The '058 Patent teaches using a combination of acoustic microphones and non-acoustic voicing sensors to classify signals as voiced or unvoiced speech and distinguish each from background noise. Claim 1 recites:

> 1.   A system for detecting voiced and unvoiced speech in acoustic signals having varying levels of background noise, comprising:
> at least two microphones that receive the acoustic signals;
> at least one voicing sensor that receives physiological information associated with human voicing activity; and
> at least one processor coupled among the microphones and the voicing sensor, wherein the at least one processor;
> generates cross correlation data between the physiological information and an acoustic signal received at one of the two microphones;
> identifies information of the acoustic signals as voiced speech when the cross correlation data corresponding to a portion of the acoustic signal received at the *one receiver* exceeds a correlation threshold;
> generates difference parameters between the acoustic signals received at each of *the two receivers*, wherein the difference parameters are representative of the relative difference in signal gain between portions of the received acoustic signals;
> identifies information of the acoustic signals as unvoiced speech when the difference parameters exceed a gain threshold; and
> identifies information of the acoustic signals as noise when the difference parameters are less than the gain threshold.

'058 Patent at 11:8–35 (emphasis added).

Samsung argues this claim is indefinite because a skilled artisan would not understand to what "the one receiver" and "the two receivers" refer—the microphones, the voicing sensor, or the processor. Jawbone, however, asserts the recited receivers are the microphones. Dkt. No. 71 at 25.

This claim is not indefinite. Each of the two limitations at issue requires the "receivers" to receive acoustic signals. As between the microphones, the voicing sensor, and the processor, only the microphones receive acoustic signals, as is expressly recited in the claim. Although Samsung argues the processor also receives acoustic signals because it is coupled to the microphone and receives the same signals the microphone receives, Dkt. No. 71 at 26, only microphones convert acoustic signals into electrical signals. *See* Dkt. No. 71 at 19 (noting "physical microphones that operate in a traditional manner" convert sounds to electrical signals).[5] Moreover, only the recitation of "the two receivers" corresponds to the earlier recitation of "at least two microphones." Thus, a skilled artisan would understand the "receiver" terms refer to the microphones, and the Court adopts Jawbone's construction for these terms.

G.   **"acoustic noise" ('091 Patent, Claims 1, 10, 11, 17)**

Plaintiff's Construction	Defendants' Construction
Plain and ordinary meaning. Alternatively, "the received acoustic signals other than the user's speech"	"Any acoustic signal that is not desired"

The '091 Patent "relates to systems and methods for detecting and processing a desired signal in the presence of acoustic noise" in speech communication systems. '091 Patent at 1:16–18. The patent describes using voice-activity detectors (VADs) to determine background noise characteristics and then subtracting an estimate of the average noise spectrum from the signal,

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[5] At most, the processor receives an electrical signal representative of an acoustic signal received by a microphone.

leaving only the desired speech signal. *See id.* at 1:22–47. The patent, however, explains that such

a technique is significantly limited in single-microphone applications when the signal-to-noise

ratio is low or in settings where the background noise varies quickly. *Id.* at 1:48–58.

To address these limitations, the patent generally teaches using at least two microphones

in different positions and using two transfer functions representative of the received acoustic

signals when there is no voicing information. Claim 1, for example, requires:

> removing *acoustic noise* from at least one of the acoustic signals by
> applying the first transfer function and at least one combination of
> the first transfer function and the second transfer function to the
> acoustic signals and generating denoised acoustic signals.

'091 Patent at 14:63–15:18 (emphasis added).

The parties appear to dispute whether "acoustic noise" can sometimes include a user's

speech. *See* Dkt. No. 71 at 29 (asserting "[a] signal *associated* with human voicing activity of a

user in no way limits 'acoustic noise' to 'received signals other than the user's speech'" (emphasis

in original)). Samsung contends the patent defines the term and the inquiry ends there:

> "[S]ignal" represents any acoustic signal (such as human speech) that is desired,
> and "noise" is any acoustic signal (which may include human speech) that is not
> desired. An example would be a person talking on a cellular telephone with a radio
> in the background. The person's speech is desired and the acoustic energy from the
> radio is not desired.

Id. at 28 (quoting '091 Patent at 2:44–58). Jawbone, however, asserts the patent "further refines

those definitions to explain that a user's 'speech is desired to be captured by the system.'" Dkt.

No. 67 at 20 (citing '159 Patent at 2:58–61, which explains "'user' describes a person who is using

the device and whose speech is desired to be captured by the system").

If, as Samsung proposes, "acoustic noise" is "any signal that is not desired," it can never

be speech of a "user," because a user is someone "whose speech is desired to be captured."

Accordingly, the Court adopts the definition in the patent as the construction for "acoustic noise,"

but clarifies that it does not encompass "user speech." "Acoustic noise" means "any acoustic signal

(which may include human speech other than the user's) that is not desired."

IV.   CONCLUSION

Term	The Court's Construction
"a signal processor coupled with the first and second microphone signals and operative . . . to apply a varying linear transfer function between the first and second microphone signals" ('357 Patent, Claim 1)	Plain and ordinary meaning
"a processing component . . . applying a varying linear transfer function between the acoustic signals" ('080 Patent, Claim 14)	Plain and ordinary meaning
"response [to speech/noise]" / "linear response [to speech/noise]" ('357 Patent, Claims 1; '080 Patent, Claims 1, 14; '691 Patent, Claim 1, 3–7, 23–34, 41–45)	Plain and ordinary meaning
"an adaptive noise removal application coupled to . . . and generating" ('080 Patent, Claim 1)	Not indefinite
"an adaptive noise removal application . . . generating denoised output signals by forming a plurality of combinations . . . by filtering and summing the plurality of combinations . . . and by a varying linear transfer function between the plurality of combinations" ('080 Patent, Claim 1)	"an adaptive noise removal application . . . generating denoised output signals by forming a plurality of combinations . . . by filtering and summing the plurality of combinations . . . and by applying a varying linear transfer function between the plurality of combinations"
"microphone" ('543 Patent, Claims 1, 26)	"physical microphone"
"the one receiver" ('058 Patent, Claim 1)	"the one of the two microphones"
"the two receivers" ('058 Patent, Claim 1)	"the two microphones that receive acoustic signals"
"acoustic noise" ('091 Patent, Claims 1, 10, 11, 17)	"any acoustic signal (which may include human speech other than the user's) that is not desired"

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The Court **ORDERS** each party not to refer, directly or indirectly, to its own or any other party's claim-construction positions in the presence of the jury. Likewise, the Court **ORDERS** the parties to refrain from mentioning any part of this opinion, other than the actual positions adopted by the Court, in the presence of the jury. Neither party may take a position before the jury that contradicts the Court's reasoning in this opinion. Any reference to claim construction proceedings is limited to informing the jury of the positions adopted by the Court.

SIGNED this 16th day of August, 2022.

ROY S. PAYNE
UNITED STATES MAGISTRATE JUDGE